

## **REMARKS**

Claims 1-41, and 45-53 are pending in the present application. Of these claims, 1-4, 9, 10, 12-25, 29-33, 35, 38-41, 45, 47, 48, 52, and 53 have been rejected. Applicants respectfully request reconsideration of these rejections based on the following remarks. Additionally, in the above amendments, claims 6 and 7 have been amended to cure informalities concerning their dependencies. Furthermore, claim 12 has been amended and no new matter is believed to be added. Support for this amendment may be found in FIGs. 3 and 4 and the accompanying text discussing these figures in the specification, as an example.

### **I. OBJECTIONS**

Claims 6 and 7 were objected to based on their originally presented dependencies on claim 1. The amendments to these claims changing their dependencies are believed to obviate the present objection.

### **II. REJECTION UNDER 35 U.S.C. §103**

Claims 1-4, 9, 10, 12-25, 29-33, 35, 38-41, 45, 47, 48, 52, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al. (US 2003/0031278). Applicants respectfully traverse this rejection based on the following reasons.

Concerning claims 1, 10, 16, 20, 22, 24, 29-31, 35, 38, 40, 45, 52, and 53, it is noted that Kang does not teach or suggest all of the elements of these claims.

Independent claim 1 features, among other things, “deriving a posteriori information for channel gain and interference for each of the received data symbols based on the feedback information for the code bits corresponding to the received data symbol.” In contrast, Kang et al. teach providing a feedback consisting of a soft-decision value  $E\{X_{l,k}\}$ , which is a function of a transmission symbol  $X_{l,k}$  (See paragraphs [0050] and [0051]). This soft-decision value  $E\{X_{l,k}\}$

is interleaved and then directly multiplied by a delayed value of received signal  $\{Y_{l,k}^a\}$  to update an initial channel gain estimate  $\{\hat{H}_{l,k}^a\}$  so as to use data symbols as well as pilot symbols in the determination of the updated channel gain estimate (See paragraphs [0053] and [0054]). In turn, it is then the updated channel estimate  $\{\hat{H}_{l,k}^a\}$  that is fed to an LLR calculator 515 (See paragraph [0054]), which is then used to calculate a log value of the ratio of a posteriori probability (APP) values of the received signal  $\{Y_{l,k}^a\}$  (See paragraph [0054] in combination with paragraph [0047]). Thus, the feedback information (i.e.,  $E\{X_{l,k}\}$ ) in Kang et al. is not taught or suggested to be used for deriving statistical “a posteriori information for channel gain and interference” as featured in claim 1. Rather APP used by an LLR calculator 515 of Kang et al., is independent of the soft-decision value feedback has been used to manipulate the channel estimate, and is thus different from the presently claimed features.

Furthermore claim 1 recites “combining the a posteriori information for channel gain and interference for the received data symbols and the prior information for channel gain and interference to obtain updated information for channel gain and interference for each of the received data symbols.” As discussed above, Kang et al. does not derive a posteriori information for channel gain and interference from the soft-decision feedback value  $E\{X_{l,k}\}$ , and, thus, necessarily cannot teach or suggest “combining the a posteriori information for channel gain and interference for the received data symbols and the prior information.” Rather, Kang et al. specifically teaches modifying the channel gain estimate  $\{\hat{H}_{l,k}^a\}$  using the soft-decision feedback value  $E\{X_{l,k}\}$ , and then utilizing a posteriori probability to calculate an LLR of the transmission bits from the updated  $\{\hat{H}_{l,k}^a\}$ .

Moreover, claim 1 includes “obtaining prior information for channel gain and interference.” It is noted that Kang et al. is silent about taking channel interference into account, and only considers a gain estimate  $\{H_{l,k}^a\}$ .

In light of the above remarks, Applicants submit that Kang et al. does not teach or suggest the claimed features of claim 1, and that modification of Kang et al. would not be obvious since such modification would change the operation of Kang away from its intended purpose.

Concerning dependent claims 2-4, 9, and 10, which depend from claim 1, these claims are also believed to be allowable on their merits, as well as the above reasons due to their dependency on independent claim 1.

With regard to independent claims 12 (as amended), 16, 20, 22, 24, 31, 38, 40, 45, 52, and 53, these claims feature one or more of the elements discussed above with regard to claim 1. Accordingly, these claims are believed to be allowable for at least one or more of the reasons given above.

Furthermore with respect to claim 24, this claim also features “decoding the forward LLRs for the code bits to obtain feedback LLRs for the code bits.” As discussed previously, Kang et al. disclose a soft-decision feedback value  $E\{X_{l,k}\}$ , not LLR values as featured in claim 24. Accordingly, Kang et al. further do not teach or suggest all the elements of claim 24.

Moreover with respect to claims 31 and 40, these claims also feature methods and apparatus where “obtaining an interference estimate” is effected. As mentioned briefly above, Kang et al. is silent concerning accounting for interference, let alone actually obtaining an interference estimate. Accordingly, these claims further are not taught or suggested by the cited reference.

With respect to the various rejected dependent claims depending from various independent claims 12, 16, 20, 22, 24, 38, 40, and 45; namely 13-15, 17-19, 21, 23, 25, 29, 30, 32, 33, 35, 39, 41, 47, and 48, these claims are believed to be allowable at least due to their respective dependencies, as well as on their merits.

In light of the foregoing comments, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 1-4, 9, 10, 12-25, 29-33, 35, 38-41, 45, 47, 48, 52, and 53 under 35 U.S.C. 103(a) based on Kang et al.

**III. ALLOWABLE SUBJECT MATTER**

Claims 5-8, 11, 26-28, 34, 36, 37, 46, and 49-51 have been objected to as being dependent on a rejected base claim but are indicated as allowable if rewritten in independent form. Applicants thank the Examiner for indicating allowable subject matter, but have not amended these claims at this time pending consideration of the above arguments.

In conclusion, Applicants respectfully submit that this application is now in condition for allowance, and request that a Notice of Allowance be issued in this case. Although no fees are believed due, please charge any fees or overpayments that may be due with this response to Deposit Account No. 17-0026.

Respectfully submitted,

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